

The Economics of Modeling & Simulation

Private Sector Economic Initiatives

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**1999 Summer Simulation
Conference**

July 14, 1999



TOPICS

- ✓ **VMASC -- Who are we?**
- ✓ **The Backhoe Simulator Story**
- ✓ **Thoughts on what I have heard and discussion topics.**
- ✓ **A marketing approach**

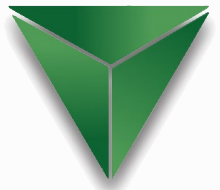
V M A S C

ENTERPRISE
CENTER



College of
Engineering & Technology

THE OPPORTUNITY



Leverage DoD Investment

M&S Software Technology

Cognitive Models

2000

Synthetic Environments

**High Level Architecture
(HLA)**

1995

ALSP/JTC

Distributed Interactive Simulation IEEE 1278

1990

Networked Simulation

1980

**Real Time
simulation to
support
planning and
operational
control of
warfare**

**Synthetic Theaters of
War**

**Distributed
Simulations**

**Training & Exercise
Support**

M&S capabilities are improving as software technology improves and stepwise using revolutionary concepts that provide enhanced fidelity and more realistic representation of outcomes.

Transfer Simulation Technology

Commercial M&S



- End-to-end process simulation
- Diagnostic models
- Dissimilar architectures
- Standalone
- Dyadic CBT

Military M&S under Development



- Entity level object oriented models
- Robust synthetic environment
- High Level Architecture to facilitate inter simulation communication
- Cognitive models based on AI

Military M&S Today



- *Attrition-based* models of combat
- *Hex-based* terrain models
- ALSP translates between models
- Human inter actors/role players

Enterprise
models to
support
Interactive
Decision Making

The Hampton Roads Advantage

✓ **Military M&S Capabilities**

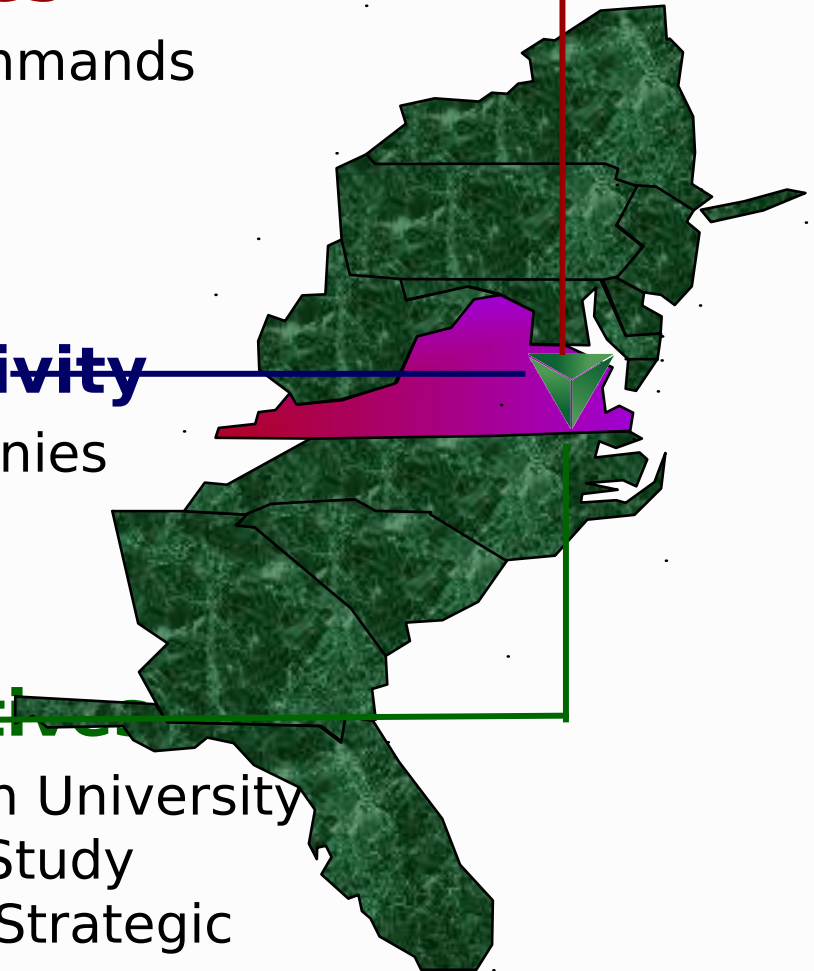
- Service Training Centers & Commands
- Armed Forces Staff College
- Doctrine Commands
- Operational Activities

✓ **Existing Simulation Activity**

- Information Technology Companies
- \$500 Million Business Base
- 10% Commercial

✓ **Related Regional Initiatives**

- Grad Programs at Old Dominion University
- Technology Council Marketing Study
- Tech Cluster in HR Partnership Strategic Plan
- International M&S Week in October 1999



THE CONCEPT



Vision

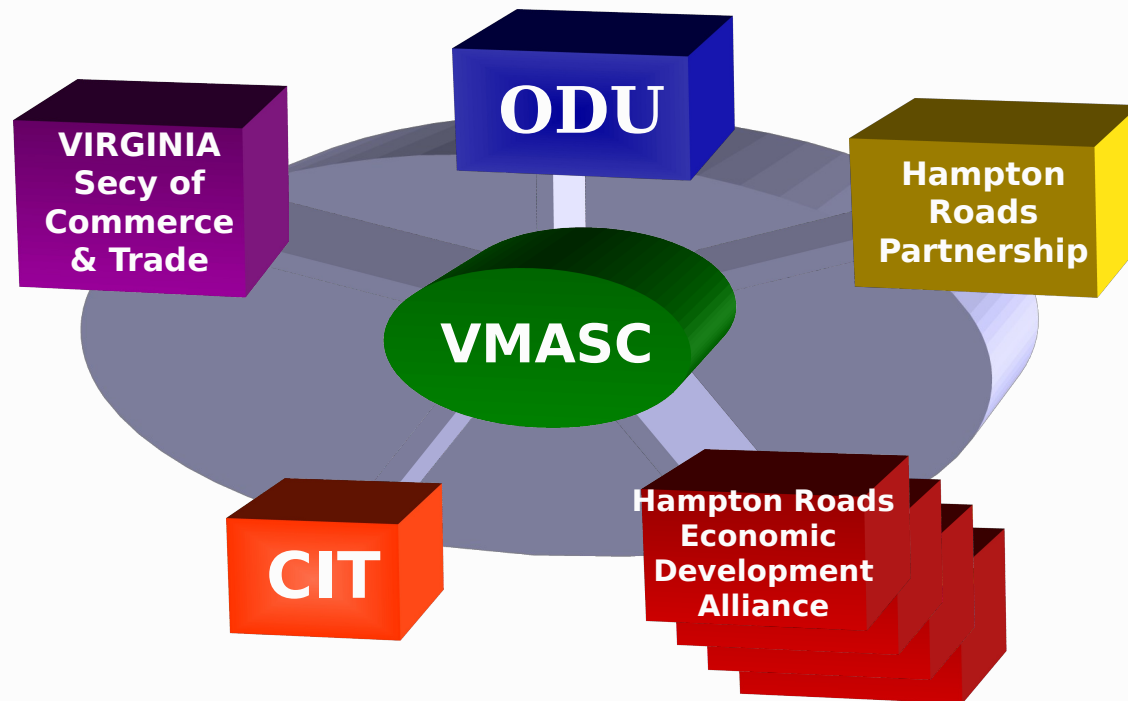
VMASC is a leading center for the development of computer modeling and simulation applications, organized as a consortium of academia, government and industry, managed by Old Dominion University and centered in Hampton Roads, Virginia.



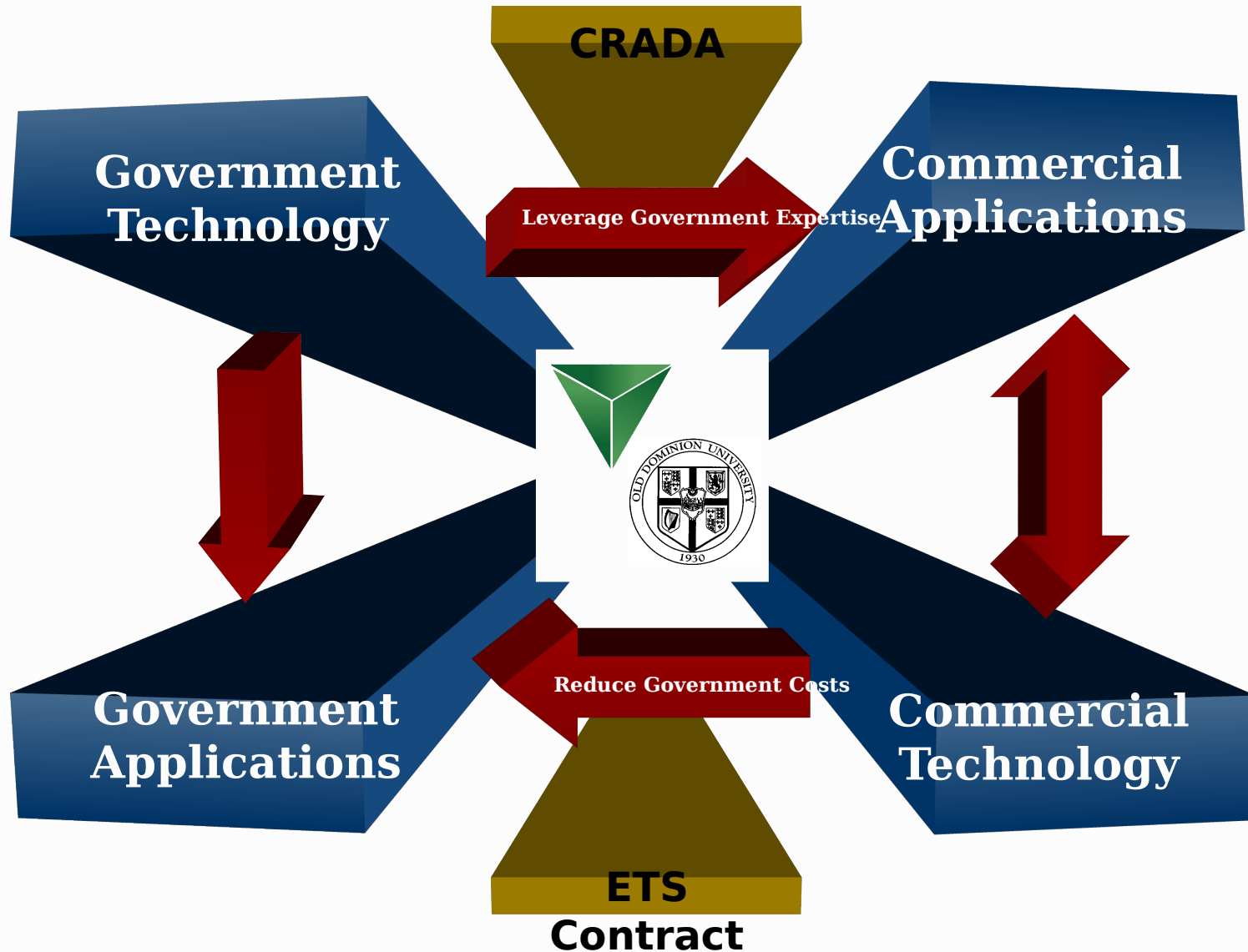
Mission

MISSION

- Stimulate Economic Development
- Conduct Research: Conceive, develop, and promote applied M&S technology
- Promote Education
- Provide Technical Expertise to Industry & Government



Two-Way Technology Transfer



Revenue

VMASC is a not for profit consortium funded by its members and the Commonwealth of Virginia

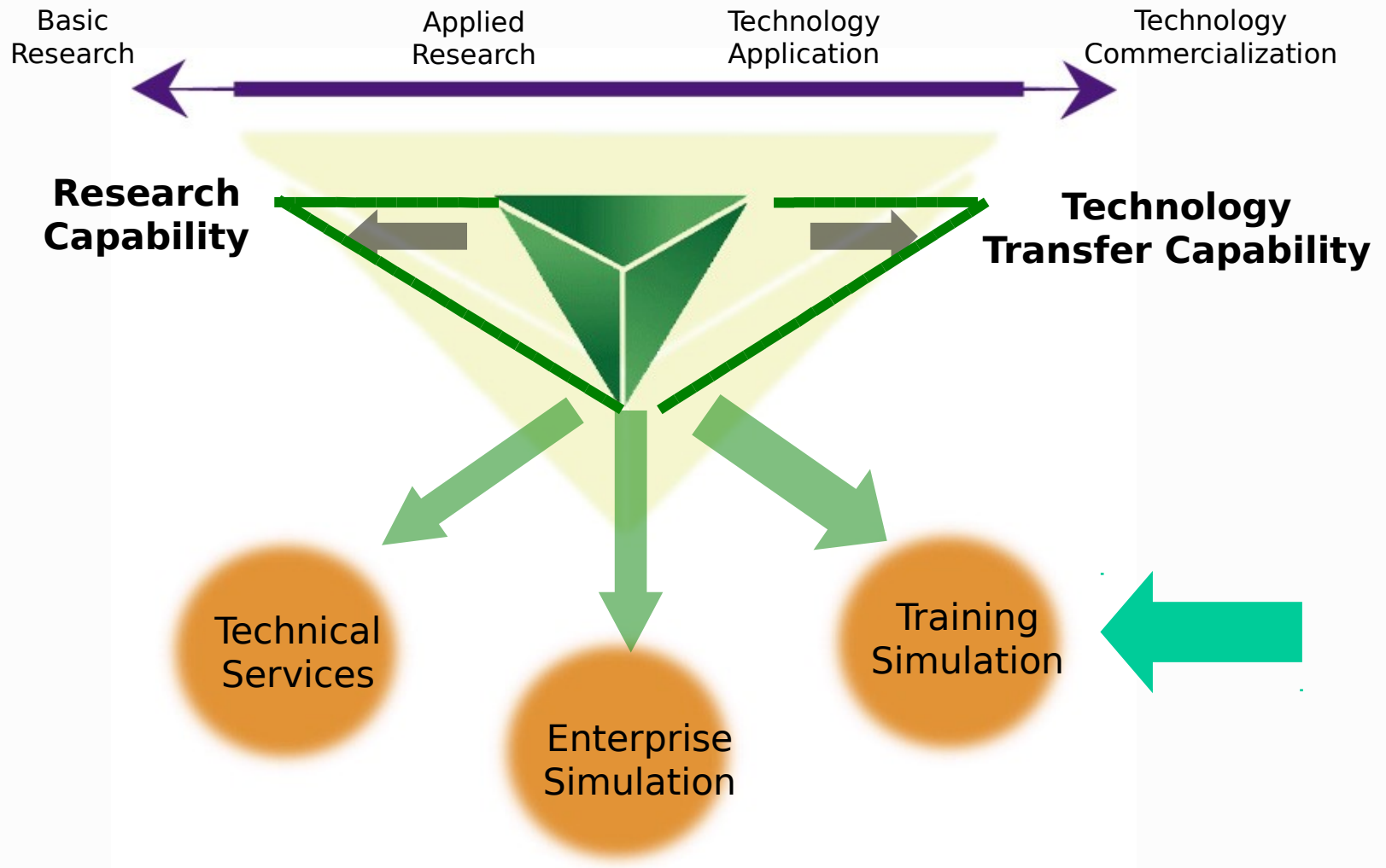
- ✔ Old Dominion University
- ✔ Commonwealth of Virginia
- ✔ City of Suffolk
- ✔ Membership Fees
- ✔ Partner Cost Share on Projects
- ✔ Support Contracts
- ✔ Funded Research
- ✔ Others: Overhead, Grants, Gifts, etc.....



Academic Involvement



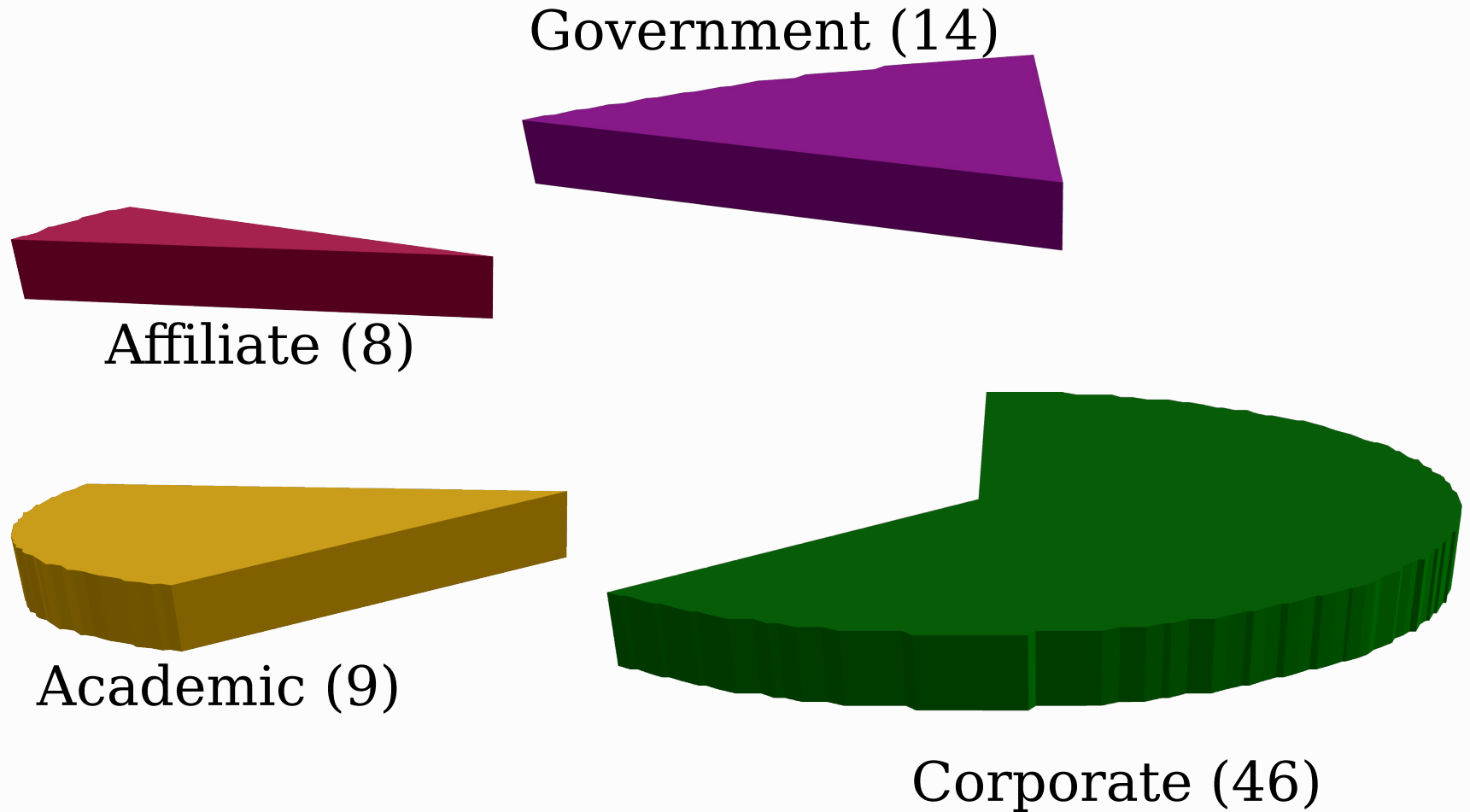
VMASC TECHNICAL FOCUS



STATUS



Consortium Membership



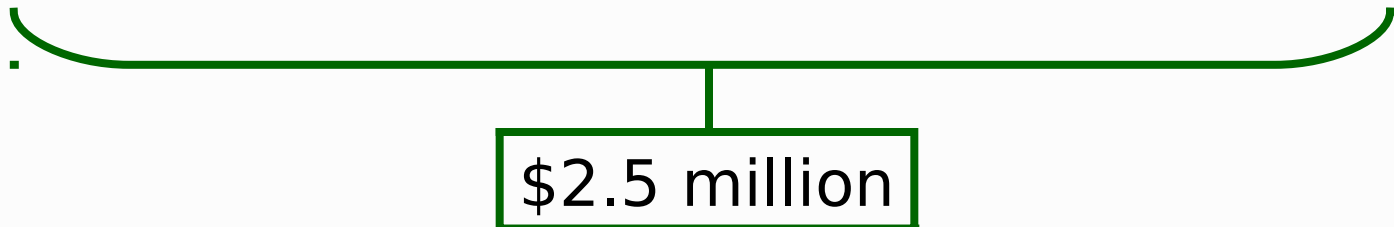
Revenue BY 98-99

Project Revenue:

- Partner Cost Share on Projects
- Support Contracts
- Funded Research

Member Contributions

- Old Dominion University support
- Industry Memberships
- Others



VMASC Facility

- ✔ **Location:** 7000 College Drive, Suffolk, VA 23435
- ✔ **Four Development Laboratories**
- ✔ **State of the Art Commercial Simulation Tools**
- ✔ **Offices, Technical Library, and Meeting and Demonstration Facilities**
- ✔ **Center LAN and High Capacity External Network Connection (DS3)**



Capabilities

HARDWARE

- 50+ Workstations
- Sun Sparkstations, SGI 02 and DEC Alpha, Intergraph, PC-NT, PC-Windows 95
- 4 Laboratories

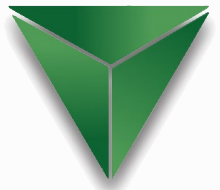
SOFTWARE

Simulation Tools and Support:

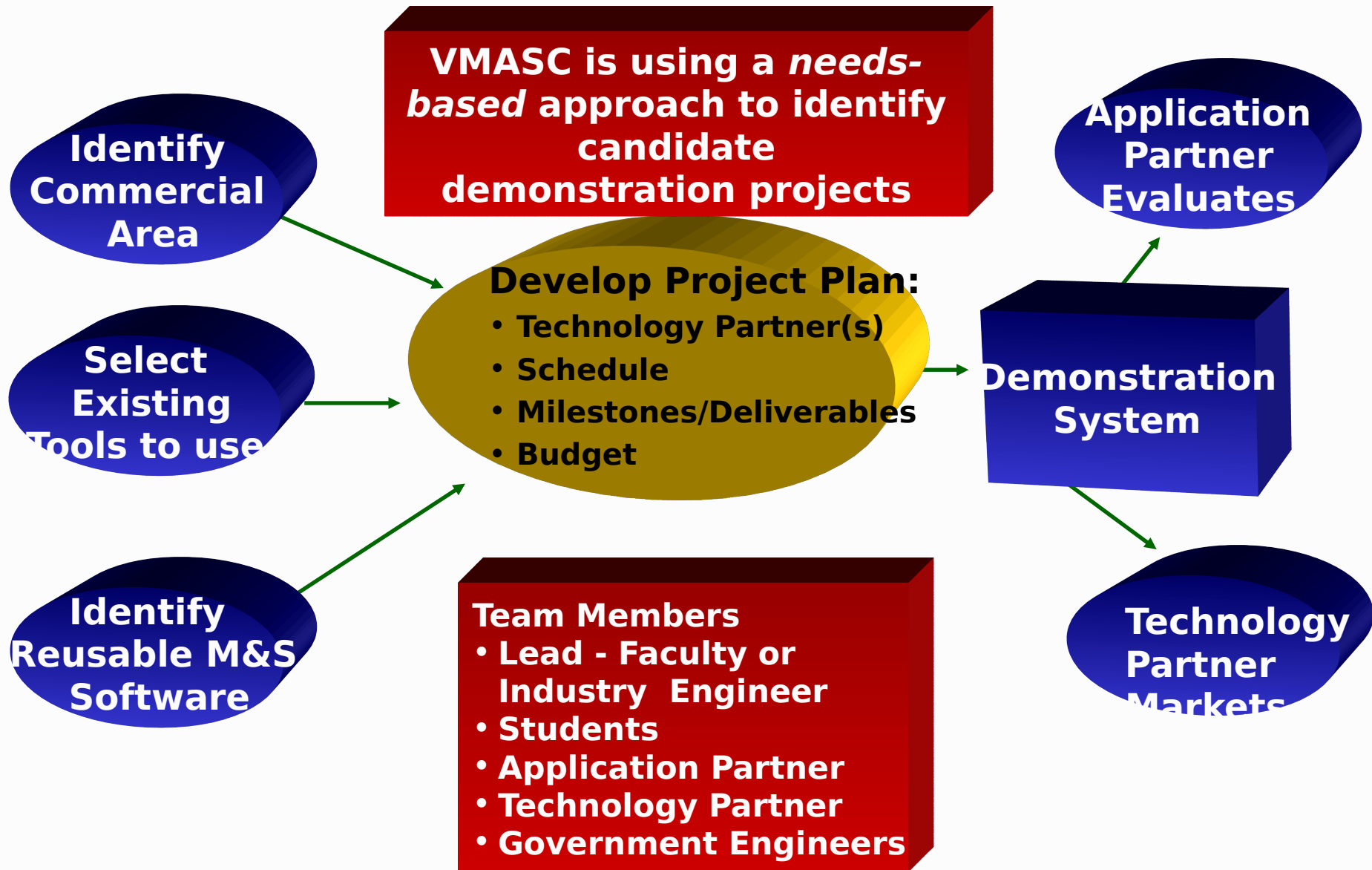
Service Model, Arena, ModSim III, Virtual Prototypes Tool Set, CACE/PM, PowerSim, Med Model, ORCA-VSE, Sense 8 World Tool Kit, CAPS Logistics Planning and Scheduling, INTERTRANS Supply Chain Management, Cosmo Utilities, Coryphaeus Tool Set, Clementine, Oracle



PROJECTS



Project Development Process



Project Areas

- **Manufacturing**
- **Training**
- **Supply Chain Management**
- **Transportation**
- **Urban Planning and Economic development**
- **Health Care**
- **Entertainment**
- **Disaster Response**



Training

Demo Project:

Interactive Simulation of Back-Hoe Operation

Application Partner:

Hampton Roads Utility & Heavy Equipment Contractors
Association

Suffolk & Isle of Wight Public Schools

Technology Partner: Asymetrix, EAI

Project Lead:

Dr. Mielke



The Backhoe Story

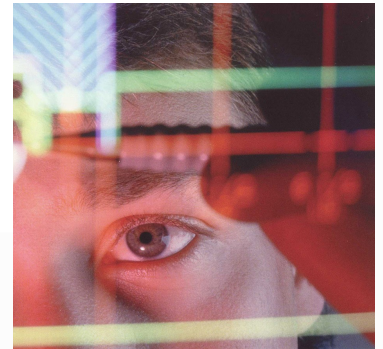
- ✓ VMASC was asked by heavy equipment and contractors association to demonstrate the potential of simulation technology
 - ✓ Industry has an image problem -- attracting young people willing to learn job skills
 - ✓ Wanted to explore ways to enhance a newly developed Vocational Technical School Curriculum
 - ✓ Association was enthused and committed to lead an effort to market the demo and find funding for full prototype
- ✓ Real equipment operators (users) endorsed the demo
- ✓ Vo Tech Teacher consulted with VMASC during development, subsequently he asked to start using the demonstration system in September 99 School Year

Real World Economics

- ✓ Economics in the small -- for the Vo Tech training program
 - ✓ School year is 36 weeks or 180 work days
 - ✓ On equipment training averages 2 hours per school day
 - ✓ Lost revenue for equipment owner is \$300 per day - \$54,000
 - ✓ Equipment wear and tear (depreciation) for a school year - \$6,000
 - ✓ Operating cost (POL and maintenance) - \$7,200
 - ✓ Total Cost to Support One Class (15 students) for a year - **\$67,200**
- ✓ Most Construction Companies are Mom & Pop Businesses
 - ✓ Cannot afford to fund technology development
 - ✓ Currently use unstructured OJT to develop operator skills
 - ✓ Never able to train emergency procedures or problems
 - ✓ Could realize significant financial benefits from better training

Thought and Discussion

- ✓ Cost Avoidance vice Cost Savings
- ✓ Marketing simulations needs to target user of results
- ✓ SBE → SBA → SBD
- ✓ Military Community has a different situation than Commercial Industry
 - Senior leaders are already proponents - value is perceived
 - Defense challenge is documenting value
 - Selling the technology to industry leaders is 15 years behind military community
- ✓ Many see inherent value but have a not in my backyard attitude
- ✓ Composability and incentives
- ✓ Where to get money - Y2K surplus!!



Thought and Discussion

- ✓ Marketing M&S
 - Selling tools and technology
 - Selling applications -- the use of M&S
- ✓ Skeptics are found at several levels
 - Managers - quickly see the inherent value of M&S
 - Business support staff - *show me the bottom line ROI*
 - IT Professionals - fear of unknown
 - M&S Professionals -- sometimes the biggest pessimists
- ✓ Should we sell a service rather than a tool or system
 - DMT
 - SIMCENTRAL

